jc715 U.S. PTO
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January 4, 2000

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

Re: Filing of U.S. Patent Application
Inventors: Gordon ARNOLD
Robert SCHREIBER
Title: SYSTEM AND METHOD FOR INTEGRATED MANAGEMENT OF ELECTRONIC MESSAGES
Attorney Docket No.: 52817.000087

Dear Sir:

Attached is a new patent application for filing in the United States Patent and Trademark Office including ten (10) pages of specification, claims (numbered 1-27), and Abstract. Also enclosed are seven (7) sheets of drawings (labeled Figs. 1-7). A copy of an executed Joint Declaration is submitted herewith. Additionally, an assignment and an assignment recordation cover sheet has been submitted.

The filing fee is calculated as follows:

					Amount
			Basic Filing Fee		$ 690.00
			Rate		
		Extra	Large Entity	Small Entity	
Number of Claims in Excess of 20	27 -20	7	$18	$9	$ 126.00
Independent Claims in Excess of 3	4 -3	1	$78	$39	$ 78.00
Assignment Recordation					$ 40.00
				TOTAL FEE DUE	**$ 934.00**

One check in the amount of $894.00 is attached to cover the basic application filing fee, and another check is included to cover the assignment recordation fee. In the event of any variance between the amount enclosed and the Patent and Trademark Office charges, please charge or credit any difference to the undersigned's Deposit Account No. 50-0206.

Please direct all communication concerning this application to:

James G. Gatto, Esq.
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Respectfully submitted,

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Dated: January 4, 2000

SYSTEM AND MESSAGE FOR INTEGRATED MANAGEMENT OF ELECTRONIC MESSAGES

Field of the Invention

The invention relates to the field of communications, and more particularly the integrated management of multiple email accounts.

Background of the Invention

The advent of the Internet has increased the demand for email and other electronic messaging services. Most Internet service providers (ISPs) offer email accounts automatically when a new user is registered. In terms of Internet email transport, the overall client/server protocol employed for transmitting email messages is the Simple Mail Transfer Protocol (SMTP). The host mail server run by the typical ISP includes an SMTP server, which handles email by managing queues and reconciling addresses. Most ISPs offer consumer Internet accounts based on dial-up (PPP) protocols. Under this protocol the consumer client, operating a personal computer or other device, uploads mail to the host email server using SMTP and downloads mail using the Post Office Protocol, presently version 3 (POP3). The typical architecture is illustrated in Fig. 1. POP3 is a low-overhead protocol for general download service, offering the ability to perform basic operations such as listing and deleting email messages.

However, deploying POP3 for email access entails disadvantages. One is that the client's personal computer must be programmed to know the precise address of the root email mailbox, by identifying the IP address of the host mail server. If the account holder's mailbox is moved to a different host mail server at a different IP address, the software on the client's personal computer must be reprogrammed to reflect the new destination. As a result, ISPs are reluctant to move account holder mailboxes, and can only do so with great attention. This limits the flexibility of ISPs in deploying new mail hosting technologies, including to change or upgrade mail servers.

Another disadvantage of the POP3 architecture is that if an account holder chooses to change ISPs entirely, there is in general no mechanism to transfer the account holder's email mailbox to the new service provider, intact. There is, moreover, no provision for the coexistence of two mailboxes with the same account name but different mail server hosts. Thus, a consumer who has changed ISPs must periodically check both the old email mailbox and the new mailbox until the transition is complete. Similarly, when an account holder maintains both a business email address and a personal email address, they must access each of those mailboxes separately.

Moreover, on the server side, ISPs need to maintain their host mail servers with modules to register and process billing information, account statistics and other value-added services. There are no industry standards for those mail server services, and they vary from one ISP to the next. Consequently, individual ISPs are effectively locked into a single vendor's package to maintain attendant services at the level of the mail server, or be forced to write conversion software when a new service package is introduced, so as not to disrupt the addressing scheme for their customers. Other problems exist.

Summary of the Invention

The invention overcoming these and other problems in the art relates to an integrated message management system and method, including a proxy server, which mediates the delivery of messages between a client workstation and multiple POP3 email servers. The proxy server communicates with the client workstation using the POP3 protocol, and maintains an associated mail registration database. The mail registration database contains entries for all of the user's email accounts, their IP addresses and associated ISP entities.

When the user wants to access their mail, the proxy server distributes mail update requests to one or more of the POP servers belonging to the user. Localizing and integrating all of the user's account addressing and other

information within the dedicated proxy server relieves the user and the network service provider from needing to reprogram clients and servers every time a new email account is shifted, added or deleted. Among other advantages, this permits relatively painless and transparent migration and the coexistence of multiple mailboxes. The invention affords greater latitude in the movement of an email mailbox amongst mailbox servers of different types, as well.

From the server point of view, the invention also allows the ISP to both deploy a common interface to the client workstation as a front-end manager, as well as permit a unified interface for server-side administrative packages.

Brief Description of the Drawings

The invention will be described with respect to the accompanying drawings, in which like elements are indicated by like numbers.

Fig. 1 illustrates an email architecture according to conventional delivery protocols.

Fig. 2 illustrates a network architecture for integrated message management according to the invention.

Fig. 3 illustrates aspects of a proxy server used in the invention.

Figs. 4 and 5 illustrate a flow chart of message processing according to the invention.

Fig. 6 illustrates an email management process presented to a user according to the invention.

Fig. 7 illustrates a directory structure of a mail registration database according to the invention.

Detailed Description of The Preferred Embodiments

The invention will be described with respect to an overall messaging architecture illustrated in Fig. 2. As illustrated in Fig. 2, in the network environment of the invention a client workstation 102 communicates via communications link 104 with a proxy server 106. Client workstation 102 may be, for instance, a personal computer running the Windows™ 95, 98 or NT™, Unix, Linux or other operating systems, and communications link 104 may be a dial-up connection, ISDN, DSL, Ethernet, cable modem, T1 or T3, or other wired or wireless digital or analog communications connection. Proxy server 106 may be, for instance, a workstation running the Windows™, NT™, Unix, Linux or other operating systems.

In the illustrative embodiment, the configured protocol between client workstation 102 and proxy server 106 is the Point to Point (PPP) standard, familiar to persons skilled in the art. Proxy server 106 is connected over connection 112 to a mail registration database 108, in which user ID, account number, ISP, Internet addressing and other information is stored. Connection 112 may be configured according to the LDAP or other protocols.

Proxy server 106 is connected via communications link 110 to a plurality of distributed email servers, 114a, 114b . . . 114n (n arbitrary), which host individual email or other messaging accounts. Communications link 110 may be, for instance, a T1 or T3, frame relay, DSL, cable modem, fiber optic, or other wired or wireless, analog or digital, backbone or other connection, including linkage to or through the Internet. Each of the email servers 114a, 114b . . . 114n is attached to a respective local email database 118a, 118b . . . 118n which hosts incoming and outgoing email messages according to the SMTP, MIME or other network protocols.

Each mail server 114a, 114b . . . 114n is connected to its respective email database via corresponding connection 116a, 116b . . . 116n, each of which may be configured according to the Standard Query Language (SQL) Net protocol or others. In general, the proxy server 106 communicates with remote

email servers 114a, 114b . . . 114n using the POP3 scheme, and also communicates with the client workstation 102 using POP3 to identify, retrieve and transmit electronic mail messages.

As illustrated in Fig. 3, proxy server 106 may contain a processing unit 120, memory 122 such as electronic RAM, input/output interface 126 and local storage 128 such as a hard drive, connected over an electronic bus 130, as will be appreciated by persons skilled in the art.

Client applications which service an electronic mailbox using the POP3 standard generally proceed through several predefined states during the course of connecting to an email server. Those states include:

TABLE 1

1. Authorization State: The user has not identified themselves to the email server.
2. Transaction State: The user has received authorization to access a mailbox on the email server. The user may issue commands to the email server to list and retrieve messages, and mark selected messages for deletion.
3. Update State: After a user has completed desired retrievals and deletions, the user may issue a quit command, which moves the session to the update state. During this state, the email server deletes any messages that were marked for deletion and terminates the connection to the client.

With conventional access packages, for each mailbox that a user wishes to enter, they must go through each of these successive states in serial fashion. While doing so, the user must keep track of the identity and addresses of each of the POP3 email servers to which they need to connect. In the invention, in contrast, and as illustrated in Fig. 5, a user at client workstation 102 connects to and is serviced by proxy server 106 by presentation of interface module 132 on the client workstation 102. The interface module 132 presents an integrated

view into all of the user's available email accounts, regardless of service provider or location. The user may, in general, view a list of all pending email messages, and mark individual messages for download or deletion from interface module 132, without needing to separately access or address each of mail servers 114a, 114b . . .114n. Interface module 132 is in one regard illustrated in Fig. 6.

An illustrative sequence of message processing is shown in Figs. 4 and 5. In step 202, processing begins. In step 204, client workstation 102 connects to proxy server 106. In step 206, proxy server 106 transmits a greeting with a message ID to the client workstation 102. In step 208, client workstation 102 transmits to proxy server 106 an APOP name digest to the proxy server 106, indicating an authorized identity of the user at client workstation 102. In step 210, proxy server 106 performs a look-up of the user's name digest against mail registration database 108.

In step 212, proxy server 106 validates the user's identity, and in step 214 transmits a message to client workstation 102 indicating acceptance of the user's access request over communications link 104. In step 216, proxy server 106 initiates transactions with one or more of mail servers 114a, 114b . . . 114n by establishing a connection to those servers via communications link 110. In step 218, the email servers 114a, 114b . . . 114n respond with a handshake greeting to proxy server 106. In step 220 proxy server 106 transmits to each mail server 114a, 114b . . . 114n user account name information particular to the user's individual account with each service provider, by looking up ID, password and associated information in mail registration database 108. In step 222, email servers 114a, 114b...114n respond with an authorization okay indication to proxy server 106.

After the authorization transactions between proxy server 106 and the distributed email servers 114a, 114b . . . 114n, the proxy server 106 transmits to each of the email servers 114a, 114b...114n a list command to initiate the generation and transmission of a list of pending email messages from each of

the individual servers. In step 226, the email servers 114a, 114b...114n respond and transmit to proxy server 106 a message list of pending email messages using the POP3 protocol.

In step 228, the proxy server 106 consolidates the message list received from each of the email servers 114a, 114b...114n for presentation to the user in consolidated message list 134. In step 230, the user at client workstation 102 transmits a list request to proxy server 106. In step 232, proxy server 106 transmits to the user a list of all pending email messages retrieved from all of the user's accounts, which is presented via interface module 132. In step 234, the user manipulates the interface module 132 using an input device such as a mouse or keyboard to indicate which messages within the consolidated message list 134 are desired to be retrieved.

In step 236, the proxy server 106 receives the retrieve command from the required workstation 102 and maps the selected message numbers to associated email accounts with corresponding email servers among email servers 114a, 114b...114n. In step 238, proxy server 106 transmits to the selected email servers a retrieve command to retrieve the user's selected email messages from the local message storage database 118a, 118b...118n for those servers. In step 240, the selected email servers transmit the indicated messages to the proxy server 106. In step 242, the proxy server 106 maps the return message to the listed consolidated message list number on interface module 132. In step 244, proxy server 106 transmits the selected messages to client workstation 102 using the POP3 protocol.

In step 246, the user at client workstation 102 transmits a delete command to delete selected messages of those presented within the consolidated message list 134, and in step 248 proxy server 106 marks the messages selected for deletion by the user in the consolidated message list 134. In step 250, the proxy server 106 transmits to client workstation 102 an OK signal indicating that deletion has been prepared, after which in step 252 client

workstation 102 transmits to proxy server 106 a quit command indicating the user's desire to terminate the message retrieval session.

Upon receipt of the quit command, the proxy server 106 transmits in step 254 a delete command to individual email servers 114a, 114b...114n hosting the email messages selected for deletion. In step 256, the email servers 114a, 114b...114n receiving the delete command delete the corresponding email messages, and transmit back to proxy server 106 a delete completion signal indicating that the pending messages have been deleted. In step 258, proxy server 106 transmits a quit command to each of the email servers 114a, 114b...114n. After receipt in step 260 each of the email servers 114a, 114b...114n respond with a quit acknowledge flag to the proxy server 106 and terminate the POP3 connection over communications link 110. In step 262, proxy server 106 transmits a session termination message to client workstation 102, causing interface module 132 to indicate the exiting from the message access session. In step 264, processing ends.

Thus, after the proxy server 106 validates a user using their user ID and password against the mail registration database 108, the proxy server 106 obtains the locations and IP addresses of the user's email mailboxes. The mail registration database 108 is illustrated in more detail in Fig. 7. As shown in that figure, the mail registration database contains global registration object 140 containing one or more profile association records 142, which relate a user ID to password, mailbox address and related fields. The proxy server 106 establishes connections to each such mailbox, retrieves a list of pending email messages and presents a consolidated message list 134 to the user on client workstation 102 via interface module 132.

The proxy server 106 then processes any further commands from the client workstation 102, including NOOP, LIST, STAT, DELE, and RSET commands without necessarily interacting with the backend email servers. It is only necessary for the proxy server 106 to interact with the email servers 114a,

114b...114n when the client workstation issues a command to retrieve a message or to quit the messaging session.

Because the proxy server 106 imitates a POP3 mail server from the point of view of the client workstation 102, proxy server 106 can parse the commands and semantics of all the interactions which occur with the client workstation 102 and present an integrated message port. Proxy server 106 may use this ability to intercept commands issued by client workstation 102 to provide further value added services using administrative module 136, associated with and running on proxy server 106.

Administrative module 136 may perform such activities as recording billing information, archives, links, cookie and other information, and logging connection statistics and other information, all on behalf of a single user entering the messaging system of the invention via proxy server 106. Thus, in the practice of the invention an extensible set of service processes may be incorporated in administrative module 136 to make the maintenance, billing and other operational aspects of the overall communication system easier to upgrade, maintain and more reliable for service providers.

The foregoing description of the invention is illustrative, and variations in configuration and implementation will occur to persons skilled in the art. For instance, while the invention has been described with respect to the retrieval of text or email messages, other kinds of message information, such as digitized voice, facsimile, alpha-numeric pages and other information may be accessed and retrieved by the invention.

Similarly, while the invention has been described with respect to a single proxy server 106 which collects and distributes email information, the invention may be carried out using an architecture having more than one proxy server giving multiple access points and connection accounts to the user. Or, the functionality described as being executed on a dedicated proxy server 106 may be distributed to one or other hardware resources, including client

workstation 102, routers, gateways and other devices. The scope of the invention is accordingly intended only to be limited by the following claims.

What is claimed is:

1. A method of managing a plurality of messages hosted on a plurality of message stores comprising the steps of:
    a. accepting message access request at a message access port; and
    b. transmitting a set of corresponding access requests to a set of associated message stores.
2. The method of claim 1 further comprising the steps of :
    c. accepting a set of replies from the associated message stores wherein the set of replies comprises a report of pending messages; and
    d. transmitting an output of a consolidated message list.
3. The method of claim 2 further comprising the steps of:
    e. accepting a second message process request;
    f. transmitting a set of associated process requests to the set of associated message stores.
4. The method of claim 3 wherein the message access port comprises a networked proxy server.
5. The method of claim 3 wherein the message stores have reassignable network addresses.
6. The method of claim 3 wherein the POP3 standard is utilized in at least one step.
7. The method of claim 3 wherein the consolidated message list comprises a list of e-mail messages.

8. The method of claim 7 wherein an administrative module at the message access port performs predetermined service functions.

9. A system for managing a plurality of messages hosted on a plurality of message stores comprising:

a message port to accept an input of a message access request;

a processor unit in communication with the message port, wherein the processor unit accesses the messages by communicating with the message stores.

10. The system of claim 9 wherein the processor unit communicates a request to each of the message stores to report pending messages.

11. The system of claim 9 wherein the messages comprise electronic mail.

12. The system of claim 9 wherein the message port comprises a networked proxy server.

13. The system of claim 9 wherein the processor unit accepts input from the message stores and creates a pending message list.

14. The system of claim 13 wherein the processor unit accepts input to create process requests for the messages on the pending message list.

15. The system of claim 14 wherein the process requests comprise at least one of selecting messages, deleting messages and reading messages.

16. The system of claim 9 wherein the POP3 standard is utilized in at least one communication.

17. The system of claim 9 wherein an administrative module at the message access port performs predetermined service functions.

18. A system for managing a plurality of messages hosted on a plurality of message store means comprising:

message port means for accepting an input of a message access request;

processing means for communicating with the message port, wherein the processing means accesses the messages by communicating with the message store means.

19. The system of claim 18 wherein the processing means communicates a request to each of the message store means to report pending messages.

20. The system of claim 18 wherein the messages comprise electronic email.

21. The system of claim 18 wherein the message port means comprises a networked proxy server.

22. The system of claim 18 wherein the processing means accepts input from the message store means and creates a pending message list.

23. The system of claim 22 wherein the processing means accepts input to create process requests for the messages on the pending message list.

24. The system of claim 23 wherein the process requests comprise at least one of selecting messages, deleting messages and reading messages.

25. A storage medium for storing computer readable code, the computer readable code being executable to manage a plurality of messages hosted on a plurality of message stores according to the steps of:

a. accepting an input of a message access request at a message access port; and

b. transmitting a set of modified access requests to a set of associated message stores.

26. The method of claim 25 further comprising the steps of :

c. accepting a set of replies from the associated message store wherein the set of replies comprises a report of pending messages; and

d. transmitting an output of a consolidated message list.

27. The method of claim 26 further comprising the steps of:

e. accepting a second input of a message process request;

f. transmitting a set of modified process requests to the set of associated message stores.

Abstract

An email proxy server system gives the user access to all of their email accounts through a unified port. The proxy server maintains a mail registration database associating the user's ID with multiple email accounts, which may be hosted on different Internet providers and otherwise. The email messages stored on the email hosts may be in POP3 format, which configuration the proxy server imitates to give the user an impression of transparent access to all of their email accounts. Because the ability to access individual mail boxes is unbound from particular internet addresses, one user may maintain any number of email mail boxes at different hosting servers, and change those addresses, without having to reprogram client, server, and other software. Moreover, the presentation of the integrated interface of the invention permits system administrators to attach service modules, such as billing and other packages directly to the proxy server to serve each of the different email accounts, without having to tailor those individual services to individual hosts hardware.

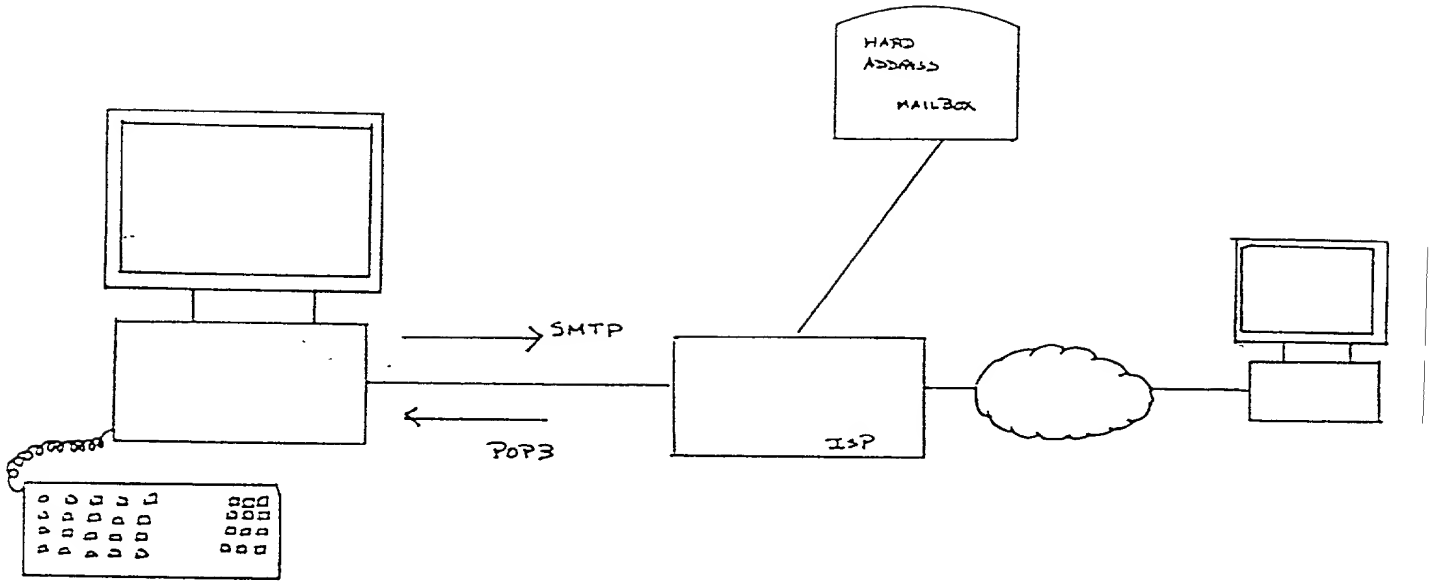

FIG. 1

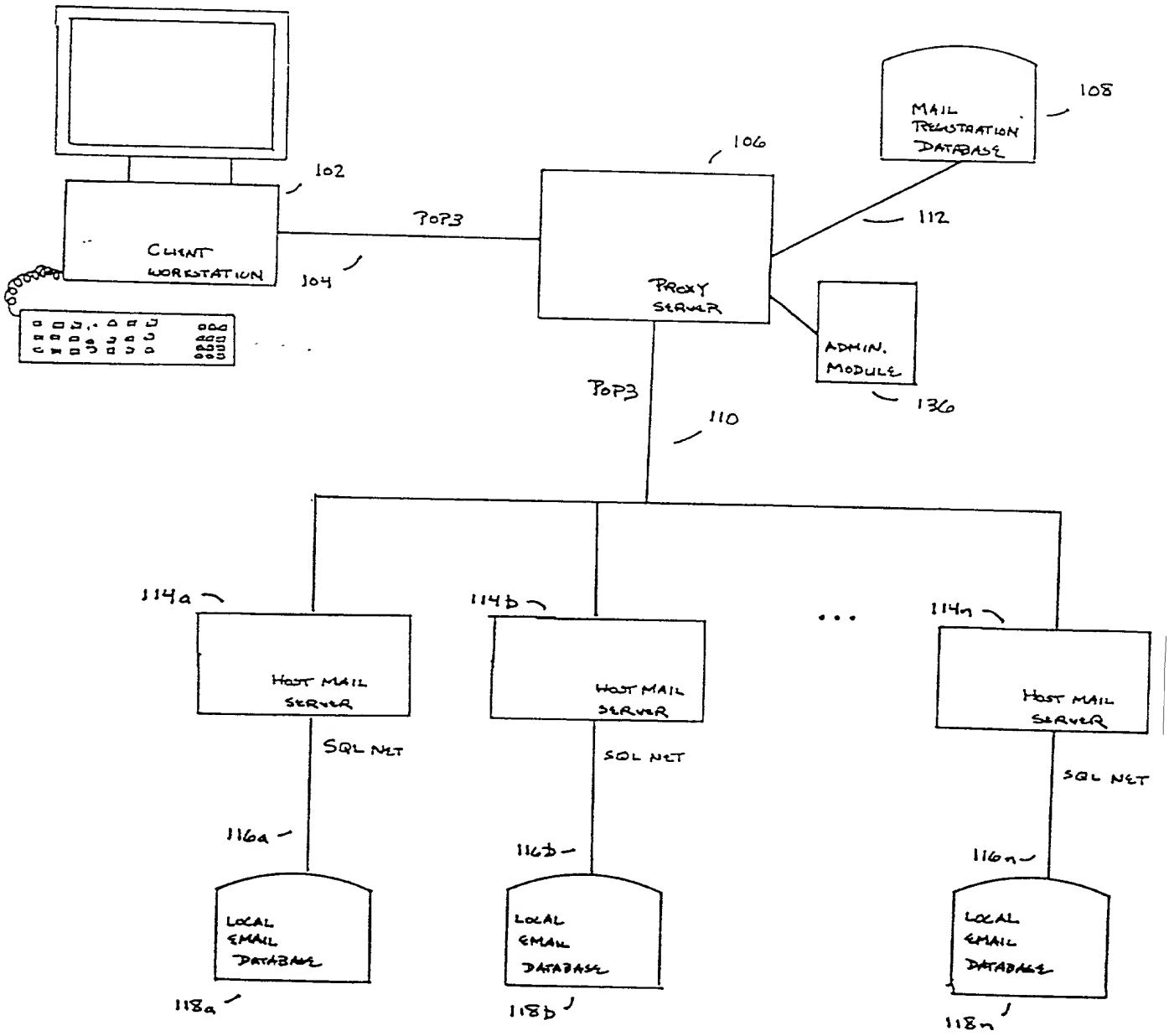
MAIL REGISTRATION DATABASE
108
106
102
POP3
CLIENT WORKSTATION
104
PROXY SERVER
112
ADMIN. MODULE
136
POP3
110
114a
114b
114n
HOST MAIL SERVER
HOST MAIL SERVER
HOST MAIL SERVER
SQL NET
SQL NET
SQL NET
116a
116b
116n
LOCAL EMAIL DATABASE
LOCAL EMAIL DATABASE
LOCAL EMAIL DATABASE
118a
118b
118n

FIG. 2

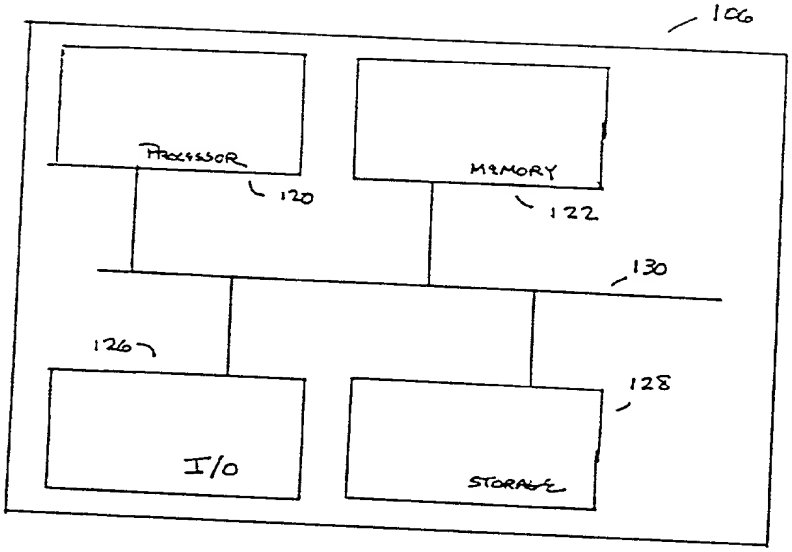

FIG. 3

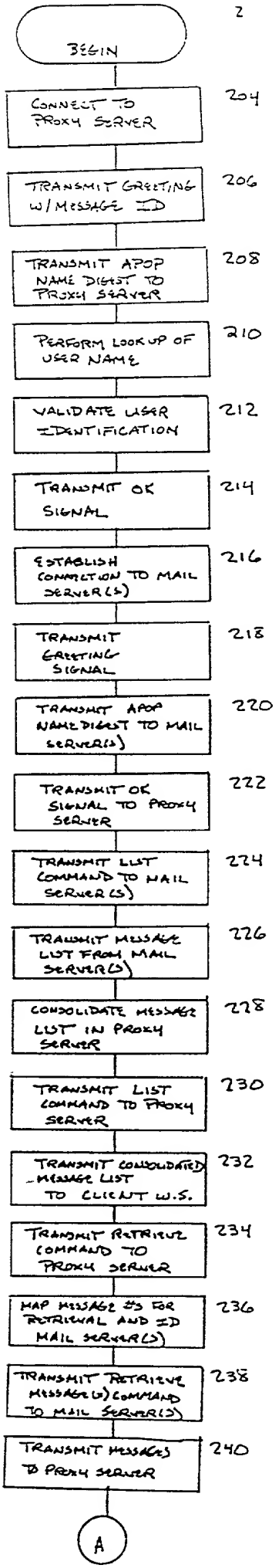
2
BEGIN
CONNECT TO PROXY SERVER
204
TRANSMIT GREETING W/MESSAGE ID
206
TRANSMIT APOP NAME DIGEST TO PROXY SERVER
208
PERFORM LOOK UP OF USER NAME
210
VALIDATE USER IDENTIFICATION
212
TRANSMIT OK SIGNAL
214
ESTABLISH CONNECTION TO MAIL SERVER(S)
216
TRANSMIT GREETING SIGNAL
218
TRANSMIT APOP NAME DIGEST TO MAIL SERVER(S)
220
TRANSMIT OK SIGNAL TO PROXY SERVER
222
TRANSMIT LIST COMMAND TO MAIL SERVER(S)
224
TRANSMIT MESSAGE LIST FROM MAIL SERVER(S)
226
CONSOLIDATE MESSAGE LIST IN PROXY SERVER
228
TRANSMIT LIST COMMAND TO PROXY SERVER
230
TRANSMIT CONSOLIDATED MESSAGE LIST TO CLIENT W.S.
232
TRANSMIT RETRIEVE COMMAND TO PROXY SERVER
234
MAP MESSAGE #S FOR RETRIEVAL AND ID MAIL SERVER(S)
236
TRANSMIT RETRIEVE MESSAGE(S) COMMAND TO MAIL SERVER(S)
238
TRANSMIT MESSAGES TO PROXY SERVER
240
A

FIG. 4

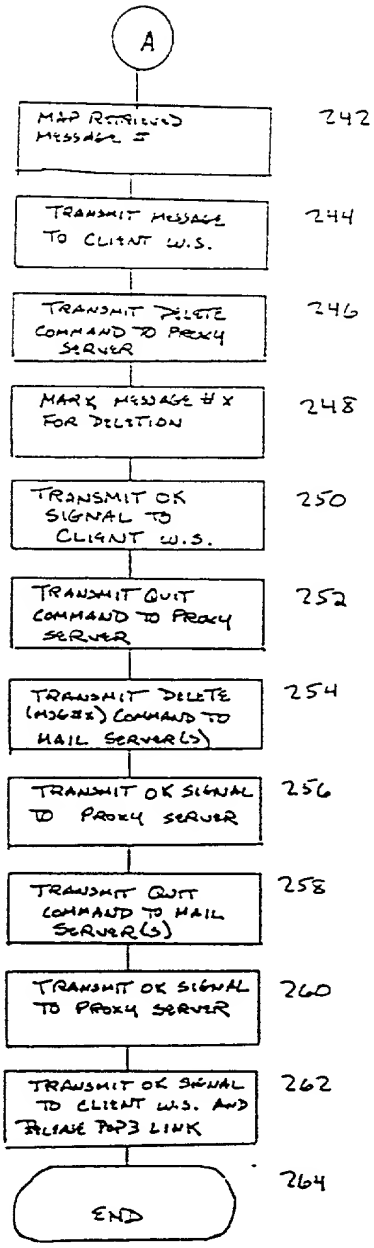
A
MAP RETRIEVED MESSAGE #
242
TRANSMIT MESSAGE TO CLIENT W.S.
244
TRANSMIT DELETE COMMAND TO PROXY SERVER
246
MARK MESSAGE # X FOR DELETION
248
TRANSMIT OK SIGNAL TO CLIENT W.S.
250
TRANSMIT QUIT COMMAND TO PROXY SERVER
252
TRANSMIT DELETE (MSG# X) COMMAND TO MAIL SERVER(S)
254
TRANSMIT OK SIGNAL TO PROXY SERVER
256
TRANSMIT QUIT COMMAND TO MAIL SERVER(S)
258
TRANSMIT OK SIGNAL TO PROXY SERVER
260
TRANSMIT OK SIGNAL TO CLIENT W.S. AND RELEASE POP3 LINK
262
END
264

FIG. 5

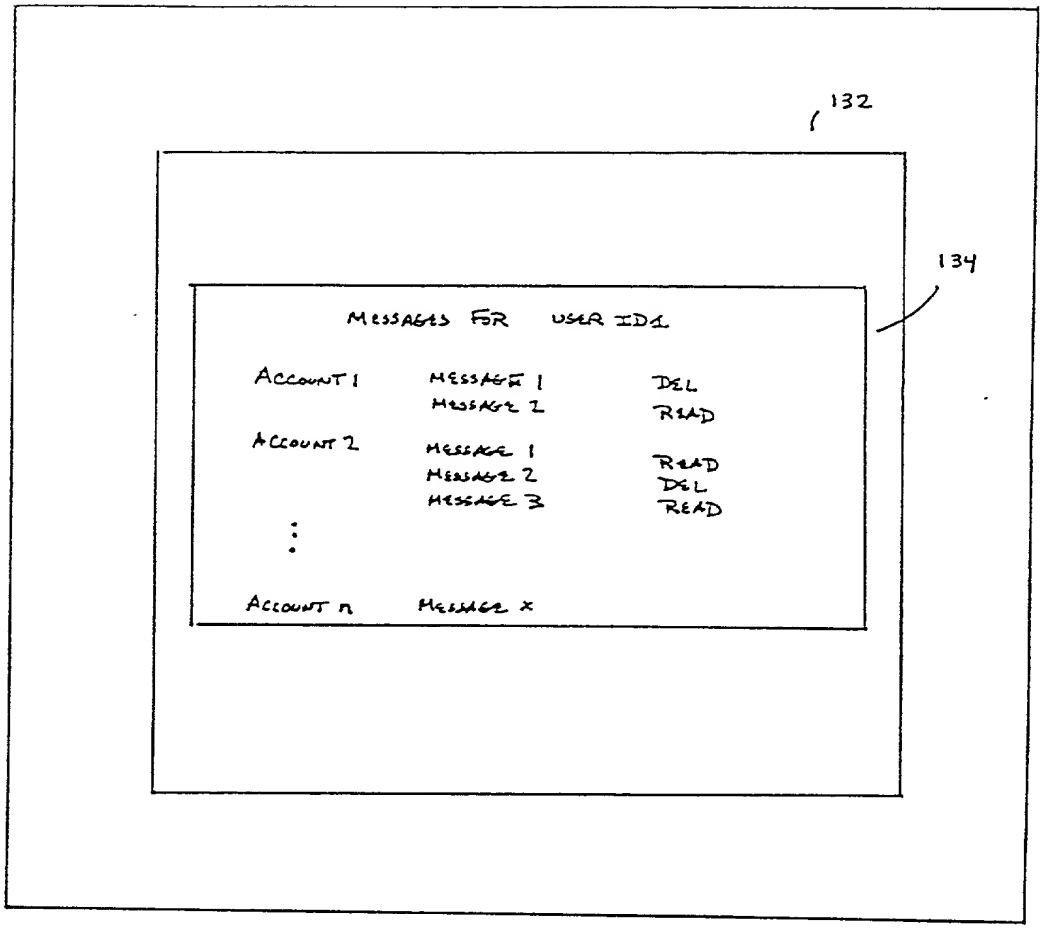
132
134
MESSAGES FOR USER ID1
ACCOUNT 1
MESSAGE 1
MESSAGE 2
DEL
READ
ACCOUNT 2
MESSAGE 1
MESSAGE 2
MESSAGE 3
READ
DEL
READ
ACCOUNT n
MESSAGE x

FIG. 6

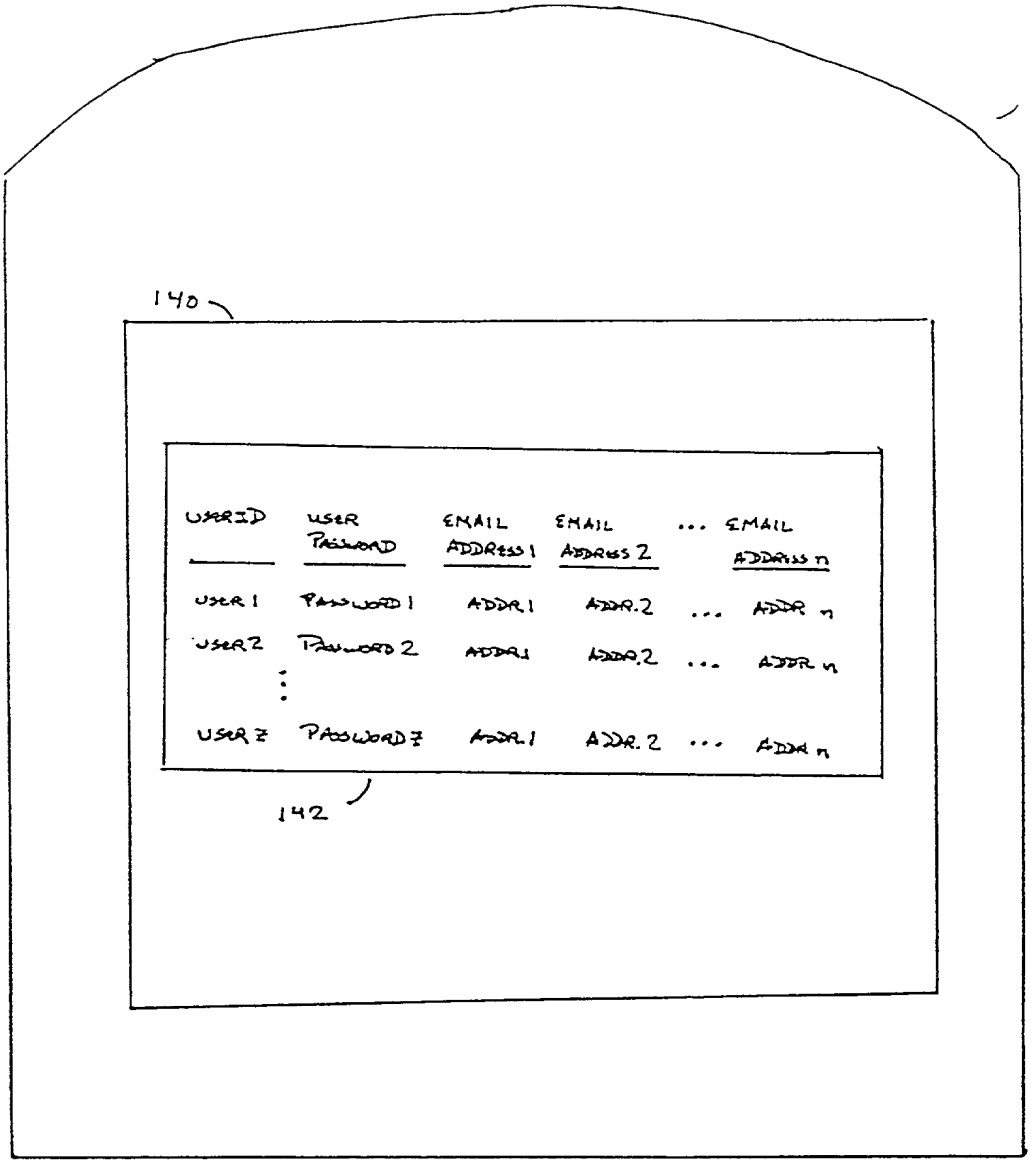
108
140
USERID
USER PASSWORD
EMAIL ADDRESS 1
EMAIL ADDRESS 2
... EMAIL ADDRESS n
USER 1
PASSWORD 1
ADDR 1
ADDR. 2
ADDR n
USER 2
PASSWORD 2
ADDR 1
ADDR. 2
ADDR n
USER Z
PASSWORD Z
ADDR 1
ADDR. 2
ADDR n
142

FIG. 7

JOINT DECLARATION FOR PATENT APPLICATION

As the below named inventors, we hereby declare that:

Our residences, post office addresses and citizenship are as stated below next to our names;

We believe that we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled SYSTEM AND METHOD FOR INTEGRATED MANAGEMENT OF ELECTRONIC MESSAGES, the specification of which

[X] is attached hereto.
[ ] was filed on _____ as Application Serial Number _____ and was amended on _____.
(if applicable)

We hereby state that we have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to in this declaration.

We acknowledge the duty to disclose all information known to us to be material to the patentability of this application, as defined in 37 C.F.R. § 1.56.

We acknowledge the duty to disclose to the Office all information known to us to be material to patentability as defined in § 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Prior Foreign Application(s)

We hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Country	Application Number	Date of Filing (day, month, year)	Date of Issue (day, month, year)	Priority Claimed Under 35 U.S.C. 119
				Yes [ ] No [ ]
				Yes [ ] No [ ]
				Yes [ ] No [ ]
				Yes [ ] No [ ]

Prior United States Application(s)

We hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial Number	Date of Filing (day, month, year)	Status - Patented, Pending, Abandoned
60/132,098	30/April/1999	Pending

And we hereby appoint, both jointly and severally, as our attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith the following attorneys, their registration numbers being listed after their names:

Thomas J. Scott, Jr., Registration No. 27,836; Stanislaus Aksman, Registration No. 28,562; Kevin J. Dunleavy, Registration No. 32,024; James G. Gatto, Registration No. 32,694; Scott D. Balderston, Registration No. 35,436; Tyler S. Brown, Registration No. 36,465; Christopher C. Campbell, Registration No. 37,291; Henry C. Su, Registration No. 37,738; Brian M. Buroker, Registration No. 39,125; Thomas G. Woolston, Registration No. 40,235; Charles F. Hollis, Registration No. 40,650; Kevin T. Duncan, Registration No. 41,495; Jonathan D. Link, Registration No. 41,548; Christopher J. Cuneo, Registration No. 42,450; Stephen T. Schreiner, Registration No. 43,097; Raphael A. Valencia, Registration No. 43,216; and George B. Georgellis, Registration No. P43,632; Matthew G. Pryor, Registration No. P45,278.

All correspondence and telephone communications should be addressed to Hunton & Williams, 1900 K Street, N.W., Suite 1200, Washington, D.C. 20006-1109, telephone number (202) 955-1500, which is also the address and telephone number of each of the above listed attorneys.

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Stacey J Bithowski, Notary Public Sept, 30, 99

My Commission Expires 2/5/03